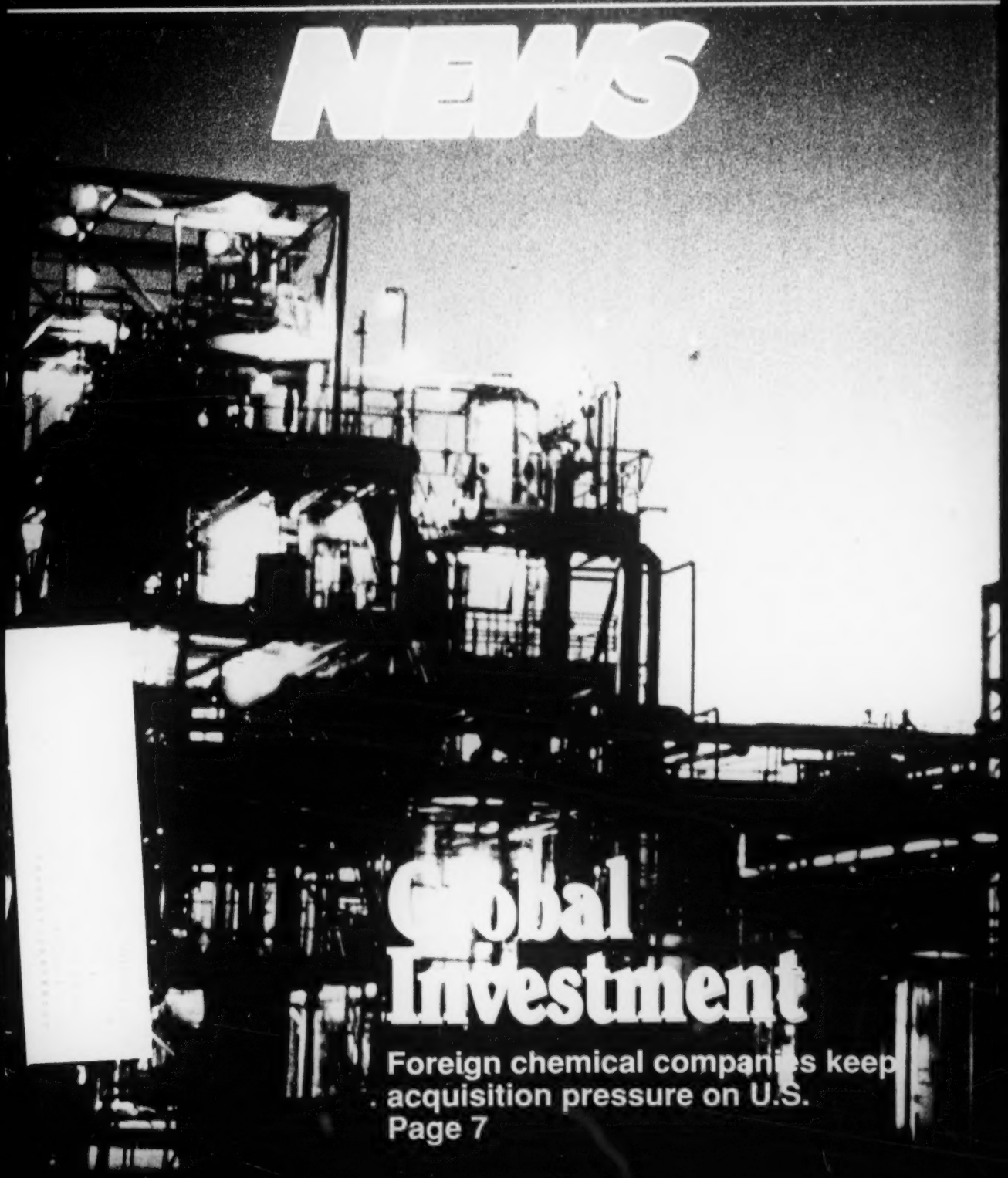
AUGUST 6, 1990
CHEMICAL & ENGINEERING

NEWS



Global Investment

Foreign chemical companies keep acquisition pressure on U.S.
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CHEMICAL & ENGINEERING
NEWS
AUGUST 6, 1990

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Cover: ICI Americas' western research center in Richmond, Calif., acquired from Stauffer in 1987

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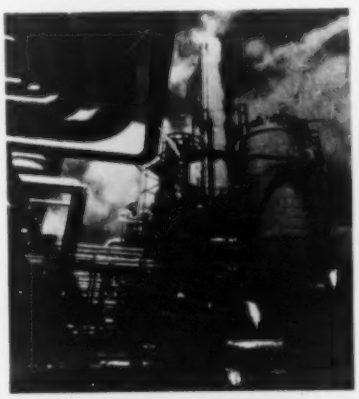

News Focus

Chemical companies worldwide are sorting through their business portfolios seeking to acquire or merge with other firms in order to secure market position, increase market share, or enter new business areas. **Page 7**

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LETTERS

CHEMICAL SAFETY

Synthesis of nopinone

Recently, we required large quantities of (+) nopinone and opted to synthesize the compound via ozonolysis of (-)-β-pinene, since that protocol is well documented [Boger, D. L., et al., *J. Org. Chem.*, **50**, 1904 (1985); Djerassi, C., Konopelski, J. P., ibid, **45**, 2297 (1980)]. It is well known that ozonolysis of olefins in hydrolytic solvents gives rise to alkyl hydroperoxide intermediates that can be decomposed by a number of reagents [e.g., H_2O, NaI, $(CH_3)_2S$, and $(RO)_3P$]. We chose to use $(CH_3)_2S$ for this decomposition followed by purification by vacuum distillation of the crude nopinone (vide supra). At the end of the distillation, within seconds of releasing the vacuum, the distilling flask exploded, shattering the oil bath. Fortunately, the author sustained only a cut to the side of his forehead (due to the flying glass).

For subsequent preparations, we decided to perform flash chromatography followed by distillation, without incident. We isolated (during chromatography) an impurity that we suspect to be an ozonide. This impurity reacted vigorously when it was being transferred to a vial, and we suspect that it was responsible for the initial explosion during the distillation (note: this impurity could not be detected by the usual peroxide tests). Our suspicions that an ozonide was responsible were supported by Dale Boger, professor at Purdue University, whose group had isolated and characterized an ozonide in their approach (private communication).

In light of the foregoing, it is recommended that researchers exercise appropriate caution when repeating this synthesis.

Patrick M. Gordon
Organix Inc., Woburn, Mass.

Risk of asbestos

Recent articles in several publications have initiated heated debate as well as significant misconception about the risk of asbestos. Almost overnight the pendulum of public perception of asbestos health hazards has swung from great fear to believing that asbestos is a relatively benign substance. Various publications have now referred to removal of asbestos as "fruitless" and an "unwarranted ripoff." The realistic and responsible positioning of the danger of asbestos contamination should be somewhere in between these extreme positions. There had been a general trend toward proposing ad hoc removal of all asbestos. This, in fact, was probably an overreaction. However, there is no scientific doubt that where asbestos is deteriorated or disturbed, people are exposed to a great physical danger.

The current controversy started with the "Harvard Symposium." This "study" has been generally dismissed by the scientific community as lacking sufficient empirical support to reach its conclusions. The one-sided review of previously presented articles was funded by the National Association of Realtors and the Safe Building Alliance. The Safe Building Alliance is a group of former asbestos product manufacturers saddled with huge damage payments from asbestos-related claims. It would appear that these organizations have vested financial interest in this important issue's fading away, regardless of the potential health implications.

Asbestos, when not disturbed, presents no risk unless its fibers are released into the air. Unfortunately, asbestos is easily and often disturbed. Volleyballs hit gym ceilings treated with sprayed-on asbestos, buildings crumble after catching fire, workmen disturb asbestos-contaminated materials within the school or workplace while accomplishing everyday maintenance, and with common building airflow everyone is assured of some amount of dosage. The asbestos removal industry overwhelmingly agrees that a proactive establishment of an in-place management control program is the preferred method to control the release of fibers where asbestos-contaminated materials are not significantly damaged, not likely to be disturbed, or exposure to workers and building occupants is unlikely. However, we also know that children wander

Markets, Strategy Are Driving Worldwide Chemical Investment

U.S. is looking to buy in Western Europe, Europeans are seeking to buy in the U.S., and all are checking the opportunities in Japan; aim is to secure place in growing market, up market share, or enter new business area

Patricia L. Layman, C&EN London

Like playing through cards to work out winning hands, chemical companies large and small are sorting out portfolios of businesses to see, in effect, which cards should be kept, which discarded, and which new cards to draw. In the process, this reshuffling has brought on an increasingly international look and feel to a chemical industry that prides itself on being global.

Companies are increasingly willing to acquire new businesses or merge with other companies in international markets to help secure position in an expanding market, to enhance market share in a particular business, or to enter a completely new business area.

U.S. chemical companies were among the earliest players in the game as they strove to become multinational in the 1960s and 1970s. Their major area of attention was Western Europe. The traumatically difficult times for the petrochemicals industry in Western Europe at the beginning of the 1980s, however, prompted some pulling back. And only in the past few years has there been a resumption of merger and acquisition activities by U.S. companies in Western Europe.

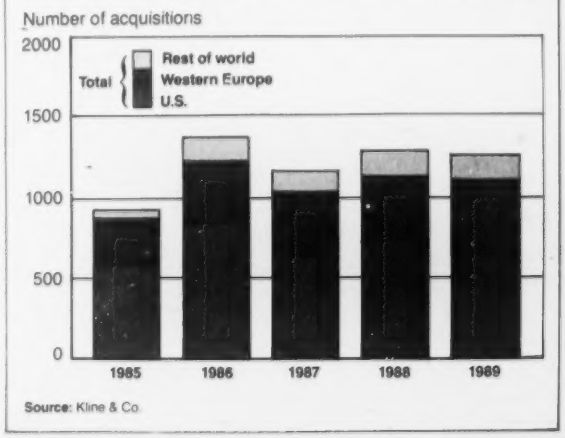
During those same years, however, there has been a signal shift in willingness of European companies to invest outside their own countries. Much of the merger and acquisition activity in Western Europe in the early and mid-1980s was part of the industry's efforts to rationalize, consolidating what were frequently fragmented businesses and cutting capacity where there was a significant overage. Industry analysts say part of the buying and selling game still isn't over—there are still, for example, more than two dozen manufacturers of ethylene in Western Europe compared with far fewer in the U.S. But the rationalization work has slowed.

Now, instead, the view is international and interregional. Chemical companies in non-European Community countries, for example, are seeking to establish positions in the EC prior to the lowering of trade barriers there in 1992. A case in point is the Scandinavian countries. Finland's Neste is buying into or building petrochemical operations in the EC, while Sweden's Nobel Industries is buying companies in various specialty fields. Kemira, also of Finland, and Norway's Norsk Hydro have become the major fertilizer companies in Western Europe by acquiring operations from companies in the EC countries.

Meanwhile, European companies from all over the continent are looking at the U.S. and buying. Some of their deals have been very large—Hoechst's purchase of Celanese, at $2.8 billion, and ICI's acquisition of Stauffer, at $1.69 billion, in turn augmented when ICI sold off parts of Stauffer to Akzo ($625 million) and Rhône-Poulenc ($522 million).

According to data compiled by the mergers and acquisitions team at London-based investment bankers County Natwest, for example, there were 334 chemical deals—acquisitions, stakes, joint ventures, and merg-

U.S. is leading site of chemical acquisitions



Source: Kline & Co.

ers—involving at least one European company in 1987. Of all those, some 55 transactions reported the value, for a total of $15.2 billion. In contrast, the reported value of similar deals in 1988 was $6.19 billion, and in 1989, $6.70 billion.

Many intracountry or intraregion mergers reflect a drive for consolidation in commodity areas, says Alan Norris, assistant director of County Natwest and one of the firm's team. But the newer batches of acquisitions, particularly the international or intercontinental ones, reflect other needs for the companies: the continued drive toward globalization or "critical mass" by the large chemical companies; a shift to specialties and other high-value-added materials; and increased investment in research and development.

Globalization has been an important factor in encouraging acquisitions in the U.S., says John Knight, Norris' colleague at County Natwest. One of the goals for major chemical firms is to be among the five largest producers of their specific products. "To be in the top five globally in a product, you've got to be in the U.S."

Companies consolidating their positions worldwide can often be found in mature markets where economies of scale will bring shutdowns, terminations of workers, and so on. But for companies making acquisitions to enhance strategic development goals, the business area is usually in a growth area. It will be to the buyer's benefit to invest in plants and people, in R&D, and in product development. And if the acquisition takes the buyer into a new geographic region, it will be that much more important to retain good people who know the territory, language, laws, customs, and products.

Such acquisitions will most likely be small and choice, says Norris. "It doesn't surprise me, [with] so many acquisitions less than $25 million. These are in areas that are highly fragmented and due for consolidation—adhesives, for example, or fine chemicals or intermediates. You are not talking about big petrochemicals and commodities, but nice little businesses."

Consultants at Kline & Co., Fairfield, N.J., agree. They say the acquisitions area has always been there, and it's continuing because these are really strategic deals. Companies are buying real value not something that is going to be broken up.

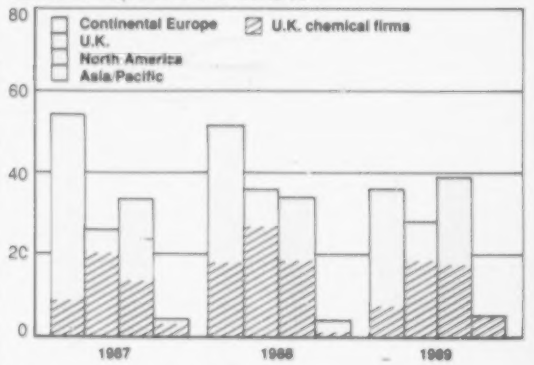
One reason why the U.S. is so attractive an arena in which to do business, besides the sheer size and homogeneity of its marketplace, is that the country's financial structures encourage ongoing reevaluation of the company's hand of cards.

For example, according to Kline, most of the recent acquisitions in the U.S. have resulted from financial reasons, usually pressure on the sellers, although occasionally on the part of the buyer.

Many of these asset sales were driven financially because the companies that owned these businesses had to restructure somehow, someway, either to improve stock performance or to fend off corporate raiders.

Says one Kline manager: "If you look at the bigger deals, the [purchasers] have been more strategic, and the foreign firms are willing to pay higher prices due to strategic considerations to get the U.S. market positions that they desire."

Among West Europeans, U.K. chemical firms active in acquisitions, divestitures



Source: County Natwest investment bank, London

To some extent, the U.K. financial structure is similar to that of the U.S., and business attitudes tend to be similar, as well. For example, say Knight and Norris of the County Natwest team, their data show it is much easier for companies to do deals in the U.K. than elsewhere in Europe. Norris points out that last year European chemical buyers made 28 purchases or divestments just in the U.K., compared with 36 in all the rest of Western Europe.

The British companies, he suggests, tend to see their businesses as a portfolio of assets—an attitude only beginning to really take hold among chemical companies on the continent. He and Knight cite, for example, BASF's announcement that it is working with New York investment bank Wasserstein Perella & Co. to arrange the sale of its fragrances and flavors division, Fritzsche Dodge & Olcott, and with bankers Morgan Stanley to sell its inks division, as an indication of strategic portfolio thinking.

At Akzo, of the Netherlands, portfolio management is also significant. Aarnout A. Loudon, chairman of the company, said at Akzo's annual meeting in April, "With the acquisition of Reliance, we have realized our highest priorities concerning the strengthening of our core businesses and the geographic distribution of our activities. Also, we will continue to evaluate our business portfolio critically. This may lead to further divestments although we are not contemplating any major divestments."

In addition to the financial structures, another factor discouraging many chemical purchases in Western Europe is the lack of publicly held small to medium-size companies. Big pools of medium-size companies such as those in the U.S. don't exist in Europe. There are fewer there because before the companies achieve that size, the bigger firms buy them up.

Moreover, company stock is often structured in such a way that hostile bids are virtually impossible. A case in point is West Germany's Henkel, a family-owned

company which in the mid-1980s sold some shares to the public. Roughly 15% of the company's shares are now traded—but all are nonvoting shares. As one analyst puts it, "Konrad Henkel hasn't given up anything and still has control over Henkel. Unless the ownership wants to sell, there is no way you can raid these companies." Persuasiveness thus becomes a prime virtue for acquisition negotiators: persuasiveness and patience, particularly when making a cross-border acquisition into continental Europe.

Speaking at a recent financial conference in London, David Margetts, chief executive of the building chemicals division of U.K.'s Laporte Group, said: "It will take two or three times as long as you imagine and more time than completing a similar deal in the U.S. or Britain. You can't pick it up and then drop it the next day." Instead, he added, the president or other senior executive of the company wishing to make the acquisition must find time in the schedule to maintain the momentum of the deal.

The need for patience is also pointed out by David Fyfe, group managing director of the U.K.-based high-value fine and research chemicals manufacturer, MTM. The firm has more than tripled its corporate sales primarily by way of small acquisitions since 1985. Sales in 1985 were less than £20 million; this year they will probably top £90 million, roughly $165 million.

According to Fyfe, MTM's early acquisition goals were to gain U.S. manufacturing capacity: at least one third of the market for these research and fine chemicals is in the U.S. and, "if you're going to be anything, you must have the capacity to offer to the U.S. Besides, U.S. companies still prefer U.S. suppliers."

Other acquisitions were made to broaden the product slate and the geographical coverage throughout Western Europe; MTM also has established technological cooperation pacts in Eastern Europe. Yet another reason—crucial for a smaller company, Fyfe says—is for the talents of the people in the acquired companies.

"When you are a small, fast-growing company, human resourcing is crucial, almost growth limiting," he says. "If you can buy a core of management as well as production, you're two steps ahead."

He concedes an obvious point: "We can never get in an auction war with a big company. Instead, we specialize in ferreting out a company, privately owned, which the owner has not put on the market, where he can be sold the benefits of cashing in now and taking long-term management with an entrepreneurial company like us. Quite often," he adds, "it is a long courtship—for example, one was for 18 months before it was finally agreed."

The ability to make a decision quickly is another plus. According to Fyfe, his company has gained "a reputation as a serious [purchaser] and a fast closer—as you say in America, we don't screw around once we decide we want a company."

At the other end of the size spectrum, executives at British chemicals giant ICI make similar points about credibility and speed of decision.

John Dewhurst, acquisitions manager at ICI, says his group becomes involved at the request of a business unit or the corporate directors. "It is fed back to us—'we want you to buy a large company in France because' ... for example. We're searching all the time, meeting regularly with all sorts of people, explaining our philosophy and strategies." Moreover, in each country, there is an arm of ICI, "and they are looking also. We want a balanced portfolio, to reflect how big we want to be in this business, or the correct geographic spread."

"We developed a set of credentials," Dewhurst says. "Now, a company will know we will give a prompt response, either over the phone or within three days. Anyone who approaches us knows we move fast. We are serious, we don't go on fishing trips. If we don't want it, we don't get the data. When we start off, we are serious."

In fact, although the company has hit the headlines for its blockbuster acquisitions, ICI has made about 45 transactions a year—both acquisitions and divestments—during the five years the acquisitions group has existed. "We apply the same criteria to all of them, to get things done," says Dewhurst. "Over the last two years, we have been doing more divesting and are now almost in balance, getting out of businesses we no longer want to be in." One of the most telling results, as he sees it: About one out of every seven or eight people in ICI have been taken on during the past five years.

Ironically, given the major inroads made by Japanese companies in industries such as automobiles and electronics, Japan is for the most part absent from chemical industry merger and acquisition activity.

Consultants agree it is difficult for western companies to invest directly in Japan, although one leading Japanese businessman believes this situation is changing. And it is still rare to see Japanese chemical companies making acquisitions in the West, although they are beginning to take more of a part in joint ventures.

And although there have been only a relatively limited number of Japanese purchases of chemical companies in the U.S. or in Western Europe, that is not because of lack of interest. Teams from U.S. and European investment banks are setting up ventures with their Tokyo counterparts so as to represent the Japanese companies that are interested in looking for business opportunities outside Japan.

Most overseas acquisition spending by U.S. chemical firms is in West Europe

$ Millions	1989	1988	1987
U.K.	—	$ 431	—
France	$ 1,143	302	$ 116
West Germany	645	182	—
Total Western Europe	**9,410**	**1640**	**3466**
Japan	1,114	—	—
Total Asia/Pacific	**1,559**	**852**	—
TOTAL ALL COUNTRIES	**$11,005**	**$2918**	**$4041**

Sources: U.S. Department of Commerce, Survey of Current Business

The early entrée for Japanese companies, says County Natwest's Norris, will be in downstream chemical businesses.

"Japanese companies are moving in very slowly in downstream areas to support their auto/electronics industries. They are starting in small joint ventures—in plastics processing, for example. That's where they are putting their money."

Shigekuni Kawamura, president of Dainippon Ink & Chemicals, basically agrees with that assessment—and the firm has been one of the few active Japanese international purchasers on the chemical scene in the past couple of years.

When he spoke at the annual meeting of the European section of the Society of Chemical Industry held last October, Kawamura commented on the absence of a takeover culture in Japan. "Because of the strong bond of unity between the company and its employees, it is very difficult for Japanese companies to carry out a takeover in their home market. It would almost be like trafficking in the lives of human beings. This is one reason why the companies in the Japanese market are more concerned about market share than profit."

On the other hand, Kawamura added, acquisitions and mergers are considered part of standard operating procedure for western firms. It would be easier for a western chemical firm to make an acquisition in Japan than for one Japanese firm to buy another, he said.

Eventually, however, he suggested that other companies would reach the same conclusions that Dainippon reached when it decided to make its bids for Sun and Reichhold. Besides a defensive measure to protect its Japanese markets for inks and resins, "these takeovers were also undertaken because of our realization that the world is becoming more and more economically unified"—and more homogeneous in style and standard of living and level of technological advancement. Dainippon "decided it could not be satisfied with its position in the Japanese market alone," he said.

Kawamura also noted, "Japanese companies are blessed with stockholders who have a long-term perspective." The blessing can be just as important for the

Europeans have been most active purchasers, but tend to stay close to home

		NUMBER OF ACQUISITIONS											
	Total	1989				1988				1987			
Company (country)	1987–89	U.S.	Europe	Other	Total	U.S.	Europe	Other	Total	U.S.	Europe	Other	Total
Elf Aquitaine[a] (France)	46	5	12	3	20	2	10	1	13	5	6	2	13
Airgas (U.S.)	35	15	—	—	15	8	—	—	8	12	—	—	12
Akzo (Netherlands)	33	6	4	2	12	4	3	4	11	4	4	2	10
Rhône-Poulenc (France)	31	5	3	2	10	4	4	5	13	1	5	2	8
Montedison (Italy)	26	2	5	3	10	2	5	1	8	4	4	—	8
ICI[b] (U.K.)	25	4	5	3	12	3	3	7	13	—	—	—	—
Du Pont (U.S.)	24	4	4	1	9	5	3	—	8	6	1	—	7
Unilever (U.K./Netherlands)	22	8	12	2	22	—	—	—	—	—	—	—	—
Courtaulds (U.K.)	21	6	4	2	12	—	—	—	—	3	6	—	9
Laporte Group (U.K.)	19	5	1	2	8	5	3	3	11	—	—	—	—
W. R. Grace (U.S.)	15	—	—	—	—	6	1	—	7	6	1	1	8
Borden (U.S.)	15	—	—	—	—	1	4	3	8	7	—	—	7
Nobel Industries (Sweden)	15	—	8	—	8	—	7	—	7	—	—	—	—
Norsk Hydro[c] (Sweden)	15	1	5	2	8	2	4	1	7	—	—	—	—
Shell Group (U.K./Netherlands)	14	1	3	3	7	2	4	1	7	—	—	—	—
Hoechst[d] (West Germany)	13	3	7	3	13	—	—	—	—	—	—	—	—
Cookson Group (U.K.)	10	—	—	—	—	6	3	1	10	—	—	—	—
BASF (West Germany)	9	—	—	—	—	2	3	4	9	—	—	—	—
Henkel (West Germany)	8	—	—	—	—	—	—	—	—	3	4	1	8
Perstorp (Sweden)	8	—	—	—	—	—	—	—	—	—	8	—	8
Air Products (U.S.)	8	—	—	—	—	3	4	1	8	—	—	—	—
Dainippon Ink & Chemicals (Japan)	8	2	4	2	8	—	—	—	—	—	—	—	—
H. B. Fuller (U.S.)	7	—	—	—	—	4	2	1	7	—	—	—	—
Lilly Industrial Coatings (U.S.)	7	7	—	—	7	—	—	—	—	—	—	—	—
Solvay (Belgium)	7	1	3	3	7	—	—	—	—	—	—	—	—

a Includes Sanofi, controlled by Elf. b Includes ICI Australia, controlled by ICI. c Includes subsidiary Dyno Industries. d Includes Roussel-Uclaf, controlled by Hoechst.
Source: Kline & Co.

Biggest acquisitions of late 1980s were in the U.S.

Seller (country)	Buyer (country)	Business sector	Purchase price ($ millions)
1987			
Sohio (U.S.) 45% outstanding	British Petroleum (U.K.)	Petroleum, chemicals	$ 7,600
Chesebrough-Ponds (U.S.)	Unilever (U.K./ Netherlands)	Personal products, chemicals	3,100
Celanese (U.S.)	Hoechst (West Germany)	Chemicals, fibers	2,800
Stauffer (U.S.)	ICI (U.K.)	Chemicals	1,690
Himont (U.S.)	Montedison (Italy)	Polypropylene	1,490
Stauffer (ex-ICI)	Akzo (Netherlands)	Specialties	625
Union Carbide (U.S.)	Rhône-Poulenc (France)	Agrochemicals	575
Feldmuehle Nobel (West Germany)	Veba (West Germany)	Chemicals, plastics	555
Stauffer (ex-ICI)	Rhône-Poulenc (France)	Basic chemicals	522
1988			
Sterling Drug (U.S.)	Eastman Kodak (U.S.)	Drugs, fine chemicals	5,100
Borg-Warner (U.S.)	General Electric (U.S.)	ABS, other plastics & chemicals	2,310
Cain Chemical (U.S.)	Oxy Petroleum (U.S.)	Petrochemicals	2,100
Koppers (U.S.)	Beazer (U.K.)	Chemicals	1,720
Staley (U.S.)	Tate & Lyle (U.K.)	Corn-based chemicals	1,500
Polysar (Canada)	Nova (Canada)	Petrochemicals	1,300
Deutsche Texaco (West Germany)	RWE (West Germany)	Petrochemicals	1,230
Cooper (U.S.)	Bayer (West Germany)	Diagnostics	500
1989			
SmithKline (U.S.)	Beecham (U.K.) merger	Drugs	16,000
Squibb (U.S.)	Bristol-Myers (U.S.)	Drugs	11,500
American Home Products (U.S.)	A. H. Robins (U.S.)	Drugs	3,170
Marion Labs (U.S.) 67%	Dow Chemical (U.S.)	Generic drugs	3,155
Dutch government	DSM (Netherlands) 67% public shareholders	Plastics, chemicals	1,350
Atlantic Richfield (U.S.)	Lyondell Petrochemicals 54% public shareholders	Petrochemicals	1,300
Pennwalt (U.S.)	Elf Aquitaine (France)	Specialty chemicals	1,240
Spanish government	Repsol, 23%—public shareholders	Petrochemicals	1,000
Connaught (Canada)	Institut Merieux (France)	Vaccines	796[a]
RTZ (U.K.)	Rhône-Poulenc (France)	Surfactants	894
Emery (U.S.)	Henkel (West Germany)	Oleochemicals	500
1990			
Nova (Canada)	Bayer (West Germany)	Synthetic rubber	845[a]

a In U.S. dollars; $1.00 U.S. = $1.184 Canadian. **Sources:** County Natwest investment bank, London; Kline & Co.

acquired company. For example, Kratos, a U.K. maker of mass spectrophotometers and other analytical instruments, was acquired in early 1989 by Shimadzu, Japan's largest producer of analytical equipment. According to John Waldron, chairman of Kratos, Shimadzu is taking a long-term view of how the firm fits with the parent.

"Their approach has been, 'How can we help you?' They have taken a lot of time and trouble to try to understand our business and about how a western company operates. There is a feeling of permanence," Waldron says. That must come as a relief to a firm that has, over several decades, been variously controlled by two large U.K. industrial companies, a U.S. high-tech business, a group of U.K. bankers, and finally Shimadzu.

Whatever the acquiring company, there are questions that must be asked. The most basic, indeed, is: "Is this a daft idea, or is it a runner?" says Geoffrey Pyke, director of the financial practices unit in Chem Systems International, in London. From there, a company must refine the considerations: How serious are the downside risks? What is the profit outlook? What is the value? Will the business stay running for another 10 years? Or will it take rehabilitation money, and if so, how much?"

Analysis of the business is crucial, agrees David R. Wallis, director of commercial development at PPG Industries. PPG, which has made several specialty acquisitions in Western Europe, turned the job over to its commercial development department in recognition of the need for a single department to bring its expertise to bear in acquisitions. "People in a group doing this once every 10 years simply won't have the expertise to know they will touch all the bases," Wallis points out.

In international acquisitions, "our experience would say that simply because the deal is foreign, that by itself doesn't create more problems or opportunities. We are largely focused on strategic businesses—there are not a great number of acquisition opportunities in Europe. We tend to know those businesses. Our people in the locations identify the opportunities where they want to expand their business. We also receive inquiries from investment bankers and similar groups, where a business is strategic and we would be a logical buyer.

"What has driven our offshore investment are the opportunities to exploit our technology, where we have world-class technology, and where we have global customers. The customer has driven it; technology has driven it; and the opportunity was there." □